

The University of Saskatchewan  
Department of Computer Science  
**CMPT 374**

**Midterm Exam****(70 marks)****March 12, 2004**

No outside materials are allowed.

Time is limited. Be sure to allocate your time to your best advantage.

Be sure that your answers are legible. If I can't read them then you won't get any marks for them.

You are to analyze the following case study and then answer the questions in the spaces provided in this question paper.

**CS Rentals**

CS Rentals is a video rental store. You have been hired to develop a database to help the staff and the customers with rental related information. The staff need to be able to record the arrival of new movies, add new customers, modify existing movie and customer data, and process rentals and returns. Customers need to be able to see their own records and to find out about movies that the store has for rent (either currently or when they are returned).

The store uses the title of a movie in order to find it. If there are multiple movies with the same title it will sort the titles by the year in which the movie was released – since movies with the same title are never released in the same year. CS Rentals categorizes all movies into one of the following categories {drama, comedy, musical, kids, documentary}. It uses information on the official Saskatchewan rating of the movie (e.g. pg, 14a, 18a) whenever a young person tries to rent a movie. Since some customers are fans of particular actors or directors, it wants to keep track of all celebrities that were involved with the movie in either or both roles, whenever it has this data. However, it has no information about celebrities other than their involvement with particular movies.

The store keeps a minimum of information about customers. They feel that they need a customer's name, a single phone number, and a credit card number to guarantee that they return rented movies. It assigns each customer with an unique customer # and expects the customer to know it in order to make a rental. CS Rentals is a small enough business that it feels that protecting access to its computers is sufficient privacy protection and it is not your job to disagree with this decision. Only CS staff will be allowed to access the system. CS staff will process all customer enquiries along with all other transactions.

CS Rentals has multiple copies of many movies to rent. It uses simple copy numbers to keep track of each copy. All copies are available for the same rental period which varies from 1 to 14 days. CS Rentals wants to keep information on customer rentals permanently. This information should include the date when the movie was rented and the date when it was returned. If a movie is returned late, the customer will be assigned late charges and will not be able to rent any further movies until the late charges are paid.